

Application No.: 10/608452

Docket No.: TOW-030

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A fuel cell, comprising:

a plurality of cell assemblies formed individually and each having a plurality of unit cells, each of said plurality of unit cells has a membrane electrode assembly including an anode, a cathode, and a solid polymer electrolyte membrane interposed between said anode and said cathode, said cell assemblies having reactant gas passages and coolant passages defined at least partly therein and connected in series with each other across said unit cells for one of supplying and circulating one or more reactant gases and a coolant to said cell assemblies;

a fuel gas outlet/inlet passage extending between the unit cells and connecting with fuel gas passages, of said reactant gas passages, for passing a fuel gas therethrough, said fuel gas outlet/inlet passage provided outside of said cell assemblies; and

a fuel gas adjusting mechanism connected to said fuel gas outlet/inlet passage for controlling the flow rate and direction of said fuel gas.

2. (Currently Amended) A fuel cell according to claim 1, further comprising:

an oxygen-containing gas outlet/inlet passage extending between the unit cells and connecting with oxygen-containing gas passages, of said reactant gas passages, for passing an oxygen-containing gas therethrough, said oxygen-containing gas outlet/inlet passage provided outside of said cell assemblies; and

an oxygen-containing gas adjusting mechanism connected to said oxygen-containing gas outlet/inlet passage for controlling the flow rate and direction of said oxygen-containing gas.

3. (Currently Amended) A fuel cell according to claim 2, further comprising:

a coolant outlet/inlet passage extending between the unit cells and connecting with said coolant passages, for passing a coolant therethrough, said coolant outlet/inlet passage provided outside of said cell assemblies; and

a coolant adjusting mechanism connected to said coolant outlet/inlet passage for controlling the flow rate and direction of said coolant.

4. (Currently Amended) A fuel cell according to claim 1, further comprising:

Application No.: 10/608452

Docket No.: TOW-030

a coolant outlet/inlet passage extending between the unit cells and connecting with said coolant passages, for passing a coolant therethrough, said coolant outlet/inlet passage provided outside of said cell assembly; and

a coolant adjusting mechanism connected to said coolant outlet/inlet passage for controlling the flow rate and direction of said coolant.

5. (Previously Presented) A fuel cell according to claim 1, wherein at least two of said plurality of unit cells of said cell assemblies are juxtaposed.

6. (Currently Amended) A method of controlling a fuel cell including a plurality of cell assemblies formed individually and each having a plurality of unit cells, each of said plurality of unit cells has a membrane electrode assembly including an anode, a cathode, and a solid polymer electrolyte membrane interposed between said anode and said cathode, said cell assemblies having reactant gas passages and coolant passages defined at least partly therein and connected in series with each other across said unit cells for one of supplying and circulating one or more reactant gases and a coolant to said cell assemblies, said method comprising the step of:

controlling a fuel gas flowing through a fuel gas outlet/inlet passage provided outside of said cell assemblies and connecting with fuel gas passages, of said reactant gas passages, and adjusting the temperatures and relative humidities of said cell assemblies with a fuel gas adjusting mechanism.

7. (Currently Amended) A method according to claim 6, further comprising the step of:

controlling an oxygen-containing gas flowing through an oxygen-containing gas outlet/inlet passage provided outside of said cell assemblies and connecting with oxygen-containing gas passages, of said reactant gas passages, and further adjusting the temperatures and relative humidities of said cell assemblies with an oxygen-containing gas adjusting mechanism.

8. (Currently Amended) A method according to claim 6, further comprising the step of:

controlling a coolant that is one of supplied to and discharged from a coolant outlet/inlet passage extending between the unit cells and connecting with said coolant passages, and further adjusting the temperatures and relative humidities of said cell assemblies with a coolant

Application No.: 10/608452

Docket No.: TOW-030

adjusting mechanism, said coolant outlet/inlet passage provided outside of said cell assemblies.

9. (Currently Amended) A method according to claim 7, further comprising the step of:

controlling a coolant that is one of supplied to and discharged from a coolant outlet/inlet passage extending between the unit cells and connecting with said coolant passages, and further adjusting the temperatures and relative humidities of said cell assemblies with a coolant adjusting mechanism, said coolant outlet/inlet passage provided outside of said cell assemblies.

10. (Previously Presented) A method according to claim 9, further comprising the step of:

controlling said reactant gases and said coolant to operate unit cells into which said coolant is initially introduced at a startup time of said cell assemblies.

11. (Currently Amended) A fuel cell, comprising:

a plurality of cell assemblies formed individually and each having a plurality of unit cells, each of said plurality of units cells has a membrane electrode assembly including an anode, a cathode, and a solid polymer electrolyte membrane interposed between said anode and said cathode, said cell assemblies having reactant gas passages and coolant passages defined at least partly therein and connected in series with each other across said unit cells for one of supplying and circulating one or more reactant gases and a coolant to said cell assemblies;

~~a fuel gas outlet/inlet passage extending between the unit cells and connecting with fuel gas passages, of said reactant gas passages, for passing a fuel gas therethrough~~ an oxygen-containing gas outlet/inlet passage extending between the unit cells and connecting with oxygen-containing gas passages, of said reactant gas passages, for passing an oxygen-containing gas therethrough, said oxygen-containing gas outlet/inlet passage provided outside of said cell assemblies; and

an oxygen-containing gas adjusting mechanism for controlling the temperature, relative humidity, and flow rate of the oxygen-containing gas.

12. (Currently Amended) A fuel cell, comprising:

a plurality of cell assemblies formed individually and each having a plurality of unit cells, each of said plurality of units cells has a membrane electrode assembly including an anode, a cathode, and a solid polymer electrolyte membrane interposed between said anode and said

Application No.: 10/608452

Docket No.: TOW-030

cathode, said cell assemblies having reactant gas passages and coolant passages defined at least partly therein and connected in series with each other across said unit cells for one of supplying and circulating one or more reactant gases and a coolant to said cell assemblies;

~~a fuel gas outlet/inlet passage extending between the unit cells and connecting with fuel gas passages, of said reactant gas passages, for passing a fuel gas therethrough~~
coolant outlet/inlet passage extending between the unit cells and connecting with said coolant passages, for passing a coolant therethrough, said coolant outlet/inlet passage provided outside of said cell assemblies; and

a coolant adjusting mechanism for controlling the temperature and flow rate of a coolant.